Gravatt, Dan

From: Schumacher, John <jschu@usgs.gov>
Sent: Monday, September 16, 2013 3:40 PM
To: Gravatt, Dan
Subject: Re: FW: FW: West Lake Landfill -- signature page needed
Attachments: USGS_addendum_private_well_sampling_v2.pdf

Dan,

Give me apologies to Dianne for the confusion. He is the page with all our signatures

john

On Mon, Sep 16, 2013 at 2:06 PM, Gravatt, Dan <Gravatt.Dan@epa.gov> wrote:

John, can you answer Diane's question below about your QA manager's signature?

Thanks,

Daniel R. Gravatt, PG

US EPA Region 7 SUPR/MOKS

11201 Renner Boulevard, Lenexa, KS 66219

Phone (913)-551-7324

Principles and integrity are expensive, but they are among the very few things worth having.

From: Harris, Diane E.
Sent: Monday, September 16, 2013 11:12 AM
To: Gravatt, Dan
Subject: RE: FW: West Lake Landfill -- signature page needed

Thanks!

Will the USGS QA Manager be signing this page too or will they be signing on a separate signature page? I know sometimes that has to happen for logistical reasons.

Diane H.

X7258

From: Gravatt, Dan
Sent: Monday, September 16, 2013 9:37 AM
To: Harris, Diane E.
Subject: FW: FW: West Lake Landfill -- signature page needed

Diane, here's the QAPP PDF with the signatures from USGS.

Daniel R. Gravatt, PG

US EPA Region 7 SUPR/MOKS

11201 Renner Boulevard, Lenexa, KS 66219

Phone (913)-551-7324

Principles and integrity are expensive, but they are among the very few things worth having.

From: Schumacher, John [mailto:jschu@usgs.gov]
Sent: Monday, September 16, 2013 9:31 AM
To: Gravatt, Dan
Subject: Re: FW: West Lake Landfill -- signature page needed

back at you.

On Mon, Sep 16, 2013 at 7:06 AM, Gravatt, Dan <Gravatt.Dan@epa.gov> wrote:

John, per my voicemail last week regarding a signed QAPP signature page for your upcoming sampling work, let me know when you'll be able to get that to me.

Thanks,

Daniel R. Gravatt, PG

US EPA Region 7 SUPR/MOKS

11201 Renner Boulevard, Lenexa, KS 66219

Phone (913)-551-7324

Principles and integrity are expensive, but they are among the very few things worth having.

From: Harris, Diane E.
Sent: Thursday, September 12, 2013 7:11 AM
To: Gravatt, Dan
Subject: West Lake Landfill -- signature page needed

Just need a signed signature page and the QAPP can be approved if you are ready to approve it. Do you want us to wait on the signature page or close out this review as a draft?

Thanks.

Diane H.

X7258

--

John G. Schumacher
Chief, Hydrologic Investigations
U.S. Geological Survey
Missouri Water Science Center
1400 Independence Road
Rolla, MO 65401
573.308.3678 573.308.3645(fax)
email: jschu@usgs.gov

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email: jschu@usgs.gov

Region 7 Superfund Program
Site Addendum for the Generic QAPP for Superfund Site Assessment Activities (October 2012)

Project Information:

Site Name: *West Lake Landfill, MOD079900932*		**City:** *Bridgeton*	**State:** *MO*
EPA Project Manager: *Dan Gravatt*		**START Project Manager:** *NA* *U.S. Geological Survey, Missouri Water Science Center*	
Approved By:	*NA*		
Title: USGS Project Manager **John Schumacher**	**Date:** 9-16-13	**Prepared For:** *EPA Region 7 Superfund Division*	
Approved By:			
Title: USGS Center Director (Missouri Water) **Mike Slifer**	**Date:** 9/16/13	**Prepared By:** **John Schumacher** **U.S. Geological Survey Missouri Water Science Center** **1400 Independence Road** Rolla, MO 65401	
Approved By:	*NA*		
Title: USGS QA Manager **Myia Barr**	**Date:** 9/16/13		
Approved By:	**Dan Gravatt**	**Date:** *August 27, 2013*	
Title: EPA Project Manager	**Date:**	**START Contractor:** *NA*	
Approved By:		**START Project Number:** *NA*	
Title: EPA Regional Quality Assurance Manager	**Date:**		

1.0 Project Management:

1.1 Distribution List

EPA--Region 7: *Dan Gravatt*, EPA Project Manager; EPA
Diane Harris, EPA RQAM
John Schumacher, USGS Project Manager

1.2 Project/Task Organization

Dan Gravatt is the EPA Project Manager
John Schumacher is the USGS Missouri Water Science Center (MWSC) Project Manager
Mike Slifer is the USGS Missouri Water Science Director and responsible for all MWSC activities including projects under this QAPP
Paul Brenden is the USGS field team leader (project hydrologic technician).

1.3 Problem Definition/Background:

Description: This addendum to the site-specific Quality Assurance Project Plan form has been prepared by the USGS. The site specific QAPP for Offsite sampling at the Westlake Landfill was prepared as an addendum to the **Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (Updated: October 2012)**, and contains site-specific data quality objectives for the sampling activities described herein.

The EPA desires to characterize naturally occurring background levels of radionuclides and other chemical constituents in the alluvial and bedrock aquifers surrounding the West Lake Landfill in Bridgeton / Earth City, MO, adjacent to the Missouri river. As part of this effort the EPA has requested assistance from the USGS. During June, 2013, the USGS conducted a search of USGS and MDNR and made a field reconnaissance on June 25, 2013. The field reconnaissance identified 7 private bedrock wells and 9 alluvial wells (with 5 additional alluvial wells possible) within 5-miles of the site that were potential candidates for sampling to establish background levels of chemical constituents. In July, 2013, the EPA sampled 6 alluvial wells north of the landfill and provided the list wells identified by USGS to the PRP contractor for incorporation into their sampling efforts. Unfortunately, the PRP contractor was able to obtain permission to sample only two additional alluvial wells south of the site. The EPA is also conducting oversight of the PRP contractor sampling of on-site monitoring wells and has need to utilize the USGS contract lab program for split radionuclide samples. . The USGS has two project tasks under this QAPP:

(1) conduct sampling of existing private wells in the vicinity of the site, and
(2) collect and provide radionuclide analysis on split water samples during scheduled October 2013 on-site groundwater sampling.

1.4 Project/Task Description:

CERCLA APA Report ☐ CERCLA SI ☐ Brownfields Assessment
☐● Other: Remedial Investigation support ☐ Pre-CERCLIS Site Screening ☐ Removal Assessment

Schedule: Field work is scheduled for *October-November, 2013*

1.5 Quality Objectives and Criteria for Measurement Data:

a. Accuracy:	■ Identified in attached table.
b. Precision:	■ Identified in attached table
c. Representativeness:	■ Identified in attached table
d. Completeness:	■ Identified in attached table.
e. Comparability:	■ Identified in attached table.

Other Description:

*A completeness goal of 50% for obtaining samples from the identified private wells has been established for this project. This goal is low because the wells are private and subject to owner consent. Of the subset of wells where access is obtained for sampling, a completeness goal of 90 percent for all field and laboratory parameters is established. However, if the completeness goal is not met, EPA may still be able to make site Decisions based on any or all of the remaining validated data.

1.6 Special Training/Certification Requirements:

■ OSHA 1910
☐ Special Equipment/Instrument Operator (describe below): na.
☐ Other (describe below): na.

1.7 Documentation and Records:

■ Field Sheets ■ Well inventory form☐ ■ Site Maps ■ Health and Safety Plan
■ Chain of Custody and Analytical Services Request (ASR) ■ Access agreement / field logbook entry
■ Letter Report ■ Photos

Sample documentation will follow standard USGS requirements in the National Field manual and the Missouri Water Science Center QAPP for Water Quality Activities, revised Jan. 2012.

Other: Analytical information will be handled according to procedures identified in Table 2.

2.0 Measurement and Data Acquisition:

2.1 Sampling Process Design:

☐ Random Sampling ☐ Transect Sampling ■ Biased/Judgmental Sampling ☐ Stratified Random Sampling
☐ Search Sampling ☐ Systematic Grid ☐ Systematic Random Sampling ☐ Definitive Sampling
☐ Screening w/o Definitive Confirmation ☐ Screening w/ Definitive Confirmation
☐ Sample

The proposed sampling scheme for groundwater from private wells will be biased/judgmental, with definitive laboratory analysis, in accordance with procedures included in OSWER Directive 9345.0-01A, "Guidance for Performing Preliminary Assessments Under CERCLA", dated September 1991, EPA/540/G-91/013; OSWER Directive 9345.1-05. "Guidance for Performing Site Inspections Under CERCLA", dated September 1992, EPA/540-R-92-021.

For Task1 (private offsite wells), samples will be collected for major and trace inorganic constituents (including metals), nutrients, VOCs, and radionuclides (isotopes of uranium, thorium, and radium), subject to access being granted by the owners. These analyses are the same as those being used for monitoring well samples collected from the Westlake site. All samples will be analyzed by the USGS National Water Quality Laboratory, except for total metals and radionuclides which will be analyzed by contract laboratories (Test America in Arvada, CO or Test America in Richmond, WA).

For Task 2 (split sampling of onsite monitoring wells), USGS will accompany EPA and PRP contractors during the scheduled October, 2013 monitoring well sampling event. The USGS will provide sample containers and process, preserve, and ship samples for isotopic U, Th and Ra to the USGS contract laboratory (Test America, Inc.) in Richmond, Washington. The EPA will collect samples for the remaining analytes which will be determined at the EPA Region 7 laboratory.

Sample Summary Location	Matrix	# of Samples*	Analysis

Task 1- Private wells within about 6 miles of the site with bias to shallow (<350 ft deep) bedrock wells.	groundwater	Up to 9 wells	Major and trace cations, major anions, nutrients, VOCs, isotopes of Ra, Th, U.
Task 2- Twelve (12) on-site monitoring wells to be selected by EPA for split sampling/oversight of PRP contractor. USGS only providing analytical support for radionuclides	Groundwater	12 monitoring wells	Isotopic Ra, Th, U

*NOTE: QC samples are not included with these totals. See Table 1 for a complete sample summary.

2.2 Sample Methods Requirements:

Matrix	Sampling Method	SOP(s)/Methods
Offsite private water supply wells	Groundwater samples will be collected according to standard USGS protocols described in section 4.2 of the USGS National Field Manual. Both filtered and unfiltered metals will be analyzed requiring filtration of samples at the field site. Private wells will be sampled from tap closest to the well, and the well will be purged until at least one well volume has been removed and until field parameters have stabilized.	*USGS National Field Manual Section 4.2* (http://water.usgs.gov/owq/FieldManual/)
Onsite Monitoring wells	Groundwater samples will be collected according to the approved PRP contractor QAPP except that USGS will process and analyze radionuclide samples.	*USGS National Field Manual Section 4.2* (http://water.usgs.gov/owq/FieldManual/)

2.3 Sample Handling and Custody Requirements:

- Samples will be processed, preserved, labeled, and shipped in accordance with procedures defined in the USGS National Field Manual at http://water.usgs.gov/owq/FieldManual/ . Sample will be shipped under chain-of-custody to the USGS laboratory or USGS contract laboratory (radionuclides).
- Other (Describe):

2.4 Analytical Methods Requirements:

- Identified in attached table 1
- Identified in attached Analytical Services Request (ASR) Form

Other (Describe):

2.5 Quality Control Requirements:

☐ Not Applicable
☐ Identified in attached table.
■ In accordance with the ***Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (Updated:* October 2012*).***
Describe QC Samples to be collected:

For Task 1 (offsite background), one equipment blank using laboratory-grade DI water will be processed. One field replicate sample, and one VOC trip blank per shipment will be processed.

For Task 2 no QA samples are planned.

Other (Describe):

2.6. Instrument/Equipment Testing, Inspection, and Maintenance Requirements :

Not Applicable
■ In accordance with the ***USGS National Field manual (http://water.usgs.gov/owq/FieldManual/) and Missouri Water Science Center Water-Quality QA Plan (2013).***
Other (Describe):

2.7 Instrument Calibration and Frequency:

For Task 1 all field meters used for field measurements (pH, specific conductance, dissolved oxygen, turbidity) will be calibrated at least daily according to the USGS National Field Manual and using manufacture procedures. Temperature, specific conductance, pH, and specific conductance will be measured using a YSI-855 or YSI pro-plus multi-parameter meter using a flow-through chamber. Turbidity will be measured using a HACH turbidity meter. For task 2, USGS will make check measurements for pH, specific conductance, and dissolved oxygen.

Calibration of laboratory equipment will be performed as described in the specific published USGS Analytical schedule or lab code referenced in attached Table 1 and USGS laboratory QAPP available at the USGS National Water Quality website at URL http://wwwnwql.cr.usgs.gov/.

☐ Other (Describe):

2.8 Inspection/Acceptance Requirements for Supplies and Consumable

For Tasks 1 and 2, all sample containers will meet USGS criteria for cleaning procedures for low-level chemical analysis and be provided by the USGS National Water-quality laboratory. Major and trace cations, and radionuclide samples will be preserved to pH <2 using ultrex ™ nitric acid. Nutrients will be preserved by chilling. Disposable capsule filters that are supplied by the USGS Nation Water Quality laboratory and certified for use for trace metals and radionuclides will be used for processing dissolved inorganic constituents and radionuclides.

☐ Other (Describe):

2.9 Data Acquisition Requirements:

☐ Not Applicable
■ In accordance with the ***Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (Updated:* October 2012*).***
Previous data/information pertaining to the site (including other analytical data, reports, photos, maps, etc., which are referenced in this QAPP) have been compiled by EPA and/or contractor(s) from other sources. Some of that data has not been verified by EPA and/or its contractor(s); however, the information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data/information.

Other (Describe):

2.10 Data Management:

■ All laboratory data acquired will be managed in accordance with the USGS Missouri Water Science Center Data Management Plan (2010) and Water Quality QA plan (2013) and stored in the USGS National Water Information System (NWIS).

Other (Describe):

3.0 Assessment and Oversight:

3.1 Assessment and Response Actions:

☐ Peer Review ☐ Management Review ☐ Field Audit ☐ Lab Audit

■ Water-quality data collected and provided by the USGS under tasks 1 and 2 undergo a stringent review process described in the USGS National Field Manual (http://water.usgs.gov/owq/FieldManual/) and the USGS National Water Quality Laboratory QA Plan (http://nwql.usgs.gov/quality.shtml) . Contract laboratory radionuclide data is first reviewed by the contract laboratory according to their QA plan, then the complete data package is reviewed and by the USGS Laboratory. The data is reviewed by the USGS project chief, and finally, the data will be reviewed and approved by the USEPA project chief.

note – In addition, for task 2, the USGS will have an external data validator experienced with radionuclide data validate both the USGS contract laboratory radiochemical data packet and the PRP contractor radiochemical data packet.

☐ Other (Describe):

3.1A Corrective Action:

■ Corrective actions will be taken at the discretion of the EPA project manager, whenever there appears to be problems that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.

☐ Other (Describe):

3.2 Reports to Management:

Task 1 (offsite sampling) A letter report describing the sampling locations, problems encountered (with resolutions to those problems), and individual analytical results and a summary of the analytical results will be provided for task 1. This will include complete analytical data packages as attachments, from the USGS contract laboratories including reviews of external contract laboratory data by the USGS laboratory will be included.

Task 2 (onsite split sampling for radionuclides). The complete radionuclide data package, including data validation review of the external contract laboratory, will be provided to the USEPA project manager. Because USGS is only providing analytical support for radionuclides, no additional narrative/report is schedule. USGS will prepare a letter report summarizing observations from field split sampling activities for submittal to the EPA project manager.

Reports prepared by the EPA, will be prepared in general accordance with the ***Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (Updated:*** **October 2012***)*.

■ Other (Describe):

4.0 Data Validation and Usability:

4.1 Data Review, Validation, and Verification Requirements:

☐ Identified in attached table.

☐

■ Data review and verification will be performed in accordance with standard USGS laboratory QA Plan at http://nwql.usgs.gov/quality.shtml

Radionuclide data for both task 1 and task 2 will be validated done by an external independent radiochemical data validator. After validation, the USGS project chief will review all data, QC data, and laboratory validation comments, and review the data in context of known groundwater geochemistry and historical data from the site before transmittal to the EPA project chief. Non-radionuclide data from the USGS laboratory or contract laboratory will not be formally validated other than the USGS laboratory and contract data review.

Other (Describe):

4.2 Validation and Verification Methods:

Identified in attached table.

■ Data generated by the USGS National Quality Laboratory will be reviewed and verified according to the laboratory QA Plan at http://nwql.usgs.gov/quality.shtml before electronic transmittal to the local USGS office NWIS database.

After review by the USGS laboratory, data is transmitted electronically to the local USGS office and the USGS project chief will reconcile laboratory data with field measurements and field notes according to the Missouri Water Science Center Water Quality QA Plan (2013). This includes comparison of sample dates, times, descriptions on field sheets and any anomalies documented. The USGS project chief also will review results of field replicates, blanks, and laboratory control samples to ensure they are acceptable for transmittal to EPA.

The EPA site manager will inspect the data to provide a final review. The EPA site manager will review the data, if applicable, for laboratory spikes and duplicates, laboratory blanks, and the field blank to ensure that they are acceptable. The EPA site manager will also compare the sample descriptions with the field sheets for consistency and will ensure that any anomalies in the data are appropriately documented.

☐ Other (Describe):

4.3 Reconciliation with User Requirements:

Identified in attached table

■ If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling or re-analysis of the subject samples may be required by the EPA site manager.

Other (Describe):

Table 1: Sample Summary

Site Name: West Lake Landfill				**City:** *Bridgeton, MO*			
USGS Project Manager: *J. Schumacher*				**Activity/ASR #:** **Background Sampling**		**Date:** October, 2013	
No. of Samples	**Matrix**	**Location**	**Purpose**	**Depth or other Description**	**Requested Analysis**	**Sampling Method**	**USGS Analytical Method/SOP**
TASK 1 Offsite background Water quality in the alluvial and Bedrock aquifer							
Up to 9	Water	Private wells	Assess background concentrations	Various or unknown	1- Dissolved major & trace inorganics 2- Dissolved Nutrients 3- Total metals (Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Se, Ag,Tl, V, Zn) [B] 4- Dissolved U, Th, Ra, isotopes 5- Total U, Th, Ra isotopes 6- VOCs	USGS NFM Sec 4.2	1- SH1260 + LC3132 2- SH 2755 3- EPA 200.7 4- LC1472 (Th), LC1366 (U), LC2164 (Ra), LC1364 (Ra) 5- LC2631 (Th), LC2637 (U), LC2789 (Ra), LC2624 (Ra) 6- SH2020
2	Water Blank	Private well Blank	QC To assess reproducibility in lab and contamination from field equipment * sample processing	1-QC Replicate 1-Equipment blank	1- Dissolved major & trace inorganics 2- Dissolved Nutrients 3- Total metals (Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Mn, Ni, Se, Ag,Tl, V, Zn) [B] 4- Dissolved U, Th, Ra, isotopes 5- Total U, Th, Ra isotopes 6- VOCs	USGS NFM Sec 4.2	1- SH1260 + LC3132 2- SH 2755 3- EPA 200.7 4- LC1472 (Th), LC1366 (U), LC2164 (Ra), LC1364 (Ra) 5- LC2631 (Th), LC2637 (U), LC2789 (Ra), LC2624 (Ra) 6- SH2020
			Check shipping contamination	Trip Blank	VOCs only		1- SH2020
TASK 2 Split sampling of PRP contractor with EPA R7 (note USGS providing analytical support for radionuclides only)							
12	Water	On-Site Monitoring wells	Verify PRP contractor data	Various	1- Dissolved U, Th, Ra, isotopes. [C] 2- Total U, Th, Ra isotopes	Approved RA QAPP with processing, according to USGS NFM Sec 4.2 [C]	1- LC1472 (Th), LC1366 (U), LC2164 (Ra), LC1364 (Ra) 2- LC2631 (Th), LC2637 (U), LC2789 (Ra), LC2624 (Ra)

A- U.S. Geological Survey, variously dated, National field manual for the collection of water-quality data: U.S. Geological Survey Techniques of Water-Resources Investigations, book 9, chaps. A1-A9, available online at http://pubs.water.usgs.gov/twri9A.

B- Total metals will be done by USGS contract laboratory (Test America, Inc., in Arvada Colorado), radionuclides are done by Test America, Inc. in Richland, Washington.

C- For radionuclides, USGS will follow RA approved QAPP for purging and sampling which will be done by the PRP contractor, but use USGS sample supplies and USGS processing , and the USGS contract laboratory. Split samples for other analytes will be processed and submitted to the EPA R7 laboratory by EPA field personnel or contractors.

Table 2: Data Quality Objective Summary								
Site Name: West Lake Landfill				**City:** *Bridgeton, MO*				
START Project Manager: *NA*				**Activity/ASR #:** 6163				**Date:** July, 2013
Analysis	**Analytical Method**	**Data Quality Measurements**					**Sample Handling Procedures**	**Data Management Procedures**
		Accuracy	**Precision**	**Representativeness**	**Completeness**	**Comparability**		
WATER (Groundwater, Drinking Water,)								
Task 1 major and trace inorganics, nutrients, VOCs, and isotopic Ra, Th, U	see Table 1	per analytical method	per analytical method	Biased/judgmental sampling based on professional judgment of the sampling team	50% of wells identified, and 90% for all analytes of wells sampled.	Standardized USGS procedures for sample collection and analysis will be used	See Section 2.3 of QAPP	See Section 2.10 of QAPP form
Task 2 Isotopic Ra, Th, U	see Table 1	per analytical method	per analytical method	Locations of split sampling with PRP contractor to be determined by EPA project chief. Samples collected in conjunction with EPA	90%;	Samples will be collected (well purging) according to approved PRP contractor QAPP. Standardized USGS procedures for sample processing and analysis will be used.	See Section 2.3 of QAPP	See Section 2.10 of QAPP form

Sampling Narrative

Introduction

The United States Environmental Protection Agency (EPA) Region 7 has request assistance from the U.S. Geological Survey (USGS) Missouri Water Science Center (MWSC) to (1) identify and conduct sampling of offsite private, commercial, and possibly public-supply wells in the alluvial and shallow bedrock aquifer in the vicinity of the Westlake Landfill site, and (2) provide analytical capability for the radionuclide analysis (isotopes of Ra, Th, and U) of split samples to be collected from onsite monitoring wells as part of the EPA oversight of PRP contractor groundwater sampling.

The purpose of the offsite sampling is to provide additional data to assist with the determination of background water quality in the alluvial and shallow bedrock aquifer at the site. The purpose of the onsite sampling is routine EPA oversight of the PRP contractor and the EPA will utilize the USGS analytical service contract for isotopic Ra, Th, and U analysis of split samples collected by the EPA and USGS field team.

The Quality Assurance Project Plan (QAPP) identifies the site-specific features and addresses elements of the sampling strategy and analytical methods proposed for this investigation.

Site Location

Bridgeton, MO.

Site Description

Contaminants have been found in the groundwater within the alluvial aquifer and shallow bedrock aquifer beneath the West Lake Landfill, some of which, can also occur naturally in geologic materials, including radium and arsenic. Monitoring wells at the site are in proximity to landfill materials and pumping from a leachate collection system at the adjacent Bridgeton Landfill complicates identification of upgradient wells and, therefore, establishing background water quality using only site data difficult. Nearby private water-supply wells will be sampled to attempt to quantify naturally occurring levels of chemical constituents. The offsite wells will be sampled for dissolved major and trace cations and major anions (Cl, F, SO4), total metals, total VOCs, and dissolved and total isotopes of Ra, Th, and U.

A review of MDNR and USGS records and a cursory field reconnaissance of the vicinity in June, 2013 confirmed the presence of some private wells in the alluvium and bedrock in the vicinity of the Westlake Landfill site (fig. 1). In July, 2013, the EPA sampled six of the private wells in the alluvial aquifer north of the Westlake site and during August, 2013, the PRP contractor sampled two of the alluvialwells south of the site (fig. 1). Because 8 offsite alluvial wells have been sampled, the focus of the USGS task 1 activity will be to locate and sample private bedrock wells in the vicinity of the site. During the June, 2013, reconnaissance, the USGS identified 6 bedrock wells and confirmed that a 7th bedrock well (former public-supply well at the Timbercrest Subdivision) had been abandoned. Wells within a 5-mi (miles) radius of the site with known or suspected completion in the Mississippian-age (Springfield Plateaus aquifer), and in a similar setting of near the end of local flow paths within the bedrock aquifer are preferred. However, based on the paucity of sampling points in this mostly urban area, any bedrock wells identified are candidates for sampling. A map of private alluvial and shallow bedrock wells in the vicinity of the site is provided as figure 1. The USEPA sampled wells C1, C2, C4, C5, C6, and C7 in June and the PRP contractor sampled wells

Up to 9 offsite private wells may be sampled with preference given to bedrock wells. At least 6 bedrock wells were identified in the June, 2013 general reconnaissance of the area by the USGS (fig. 1). In addition, the USGS NWIS database includes data from two domestic wells of suitable depth (less than 350 ft) that were sampled in the 1930s and 1940s. A reconnaissance of the former locations of these two older wells will be done as well as a review of 1950s era topographic maps to identify older homes.

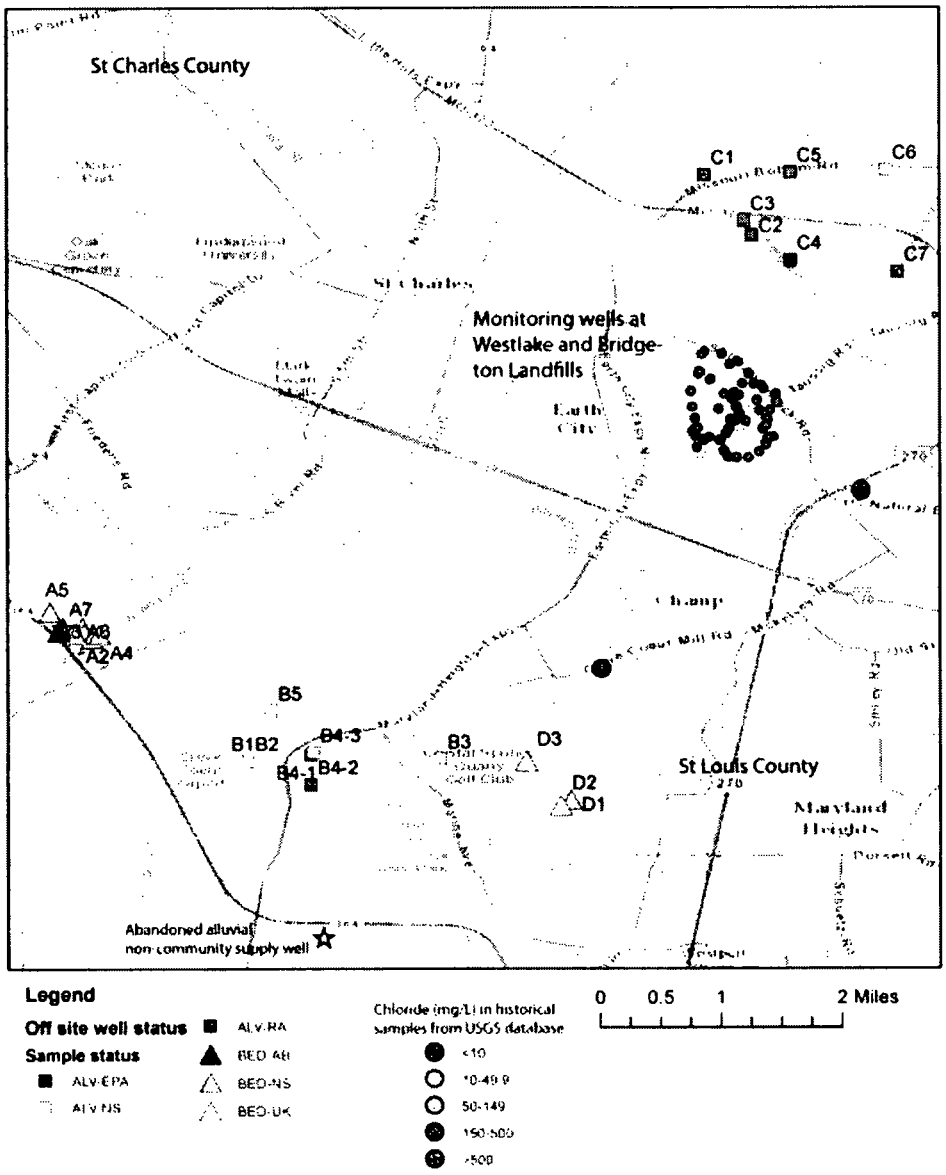

Figure 1. Status of known offsite private water supply wells in the vicinity of the Westlake Landfill.

ALV = alluvial well
BED = bedrock well

EPA = EPA July 2013 sample
RA = Remedial Action contractor August 2013, sample
NS = not sampled
UK = well location or current existence unknown

Previous Investigations

The USGS provided the list of all wells identified by the USGS during the June, 2013, to the EPA who shared the list with the PRP contractor. During July, 2013, the USEPA was able to get permission to sample 6 of 7 private wells completed in the Missouri River alluvium located north of the site. In August, 2013, the PRP contractor was able to obtain permission to sample two alluvial wells south of the site (fig. 1) but refused access to sample the remaining alluvial or bedrock wells. The EPA has asked the USGS to attempt to obtain permission to sample the remaining wells and locate additional wells in the area that might be sampled for determining background water quality..

Sampling Strategy and Methodology

The groundwater samples from the wells will be collected from taps/spigots located nearest the wellhead and prior to any in-home water treatment system. The wells will be purged according to protocols for sampling in the USGS National Field Manual (http://nwql.usgs.gov/quality.shtml). Purging general will be done to remove at least one well volume (estimated) and until field parameters of temperature (within 0.5 degrees C), specific conductance (within 2 percent), pH (within 0.25 units) are stable over three consecutive readings taken no less than 0.2 well volumes apart.

An abbreviated USGS well inventory field sheet (attached) will be completed to document each groundwater sample location. In addition, a ground-water water quality field sheet (attached) is compelted for each groundwater sample to document well purging, field measurements, and sampling information. Water samples were be processed and preserved and shipped to the USGS National Water Quality Laboratory (dissolved major and trace inorganics, nutrients, VOCs), the USGS contract laboratory in Arvada, Colorado (total metals), or the USGS contract laboratory in Richland, Washington (radionuclides).

Quality Control Samples

Task 1: To evaluate contamination during sample collection and processing, a field equipment blank will be processed at one well sample site using inorganic blank water or VOC-free pesticide grade water (VOCs). A field replicate sample also will be collected from one well and analyzed for all analytes. A trip blank (supplied by the USGS laboratory) also will be included with each VOC shipment to track possible contamination during shipping.

Task 2: USGS is only providing analytical support for radionuclides for the routine EPA R7 oversight/split sampling of the PRP contractor monitoring well sampling. USGS will accompany EPA oversight personnel and provide bottles, and process, preserve, and ship the radionuclide samples.

Analytical Methods

All samples will be analyzed by prublished EPA methods (radionuclides, and total metals) or published USGS methods that are standard EPA or modified EPA methods. Standard reporting levels will be used. USGS VOC reporting levels are in the 0.2 ug/L range for most analytes, 1 ug/L or less for most dissolved metals, 0.5 mg/L for major cations and anions, and 0.1 mg/L or less for nutrients. Copies of the USGS laboratory schedules and lab codes with reporting levels and method codes are attached. A standard USGS analytical services request form (generated electronically) will be utilized for all samples.

References

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